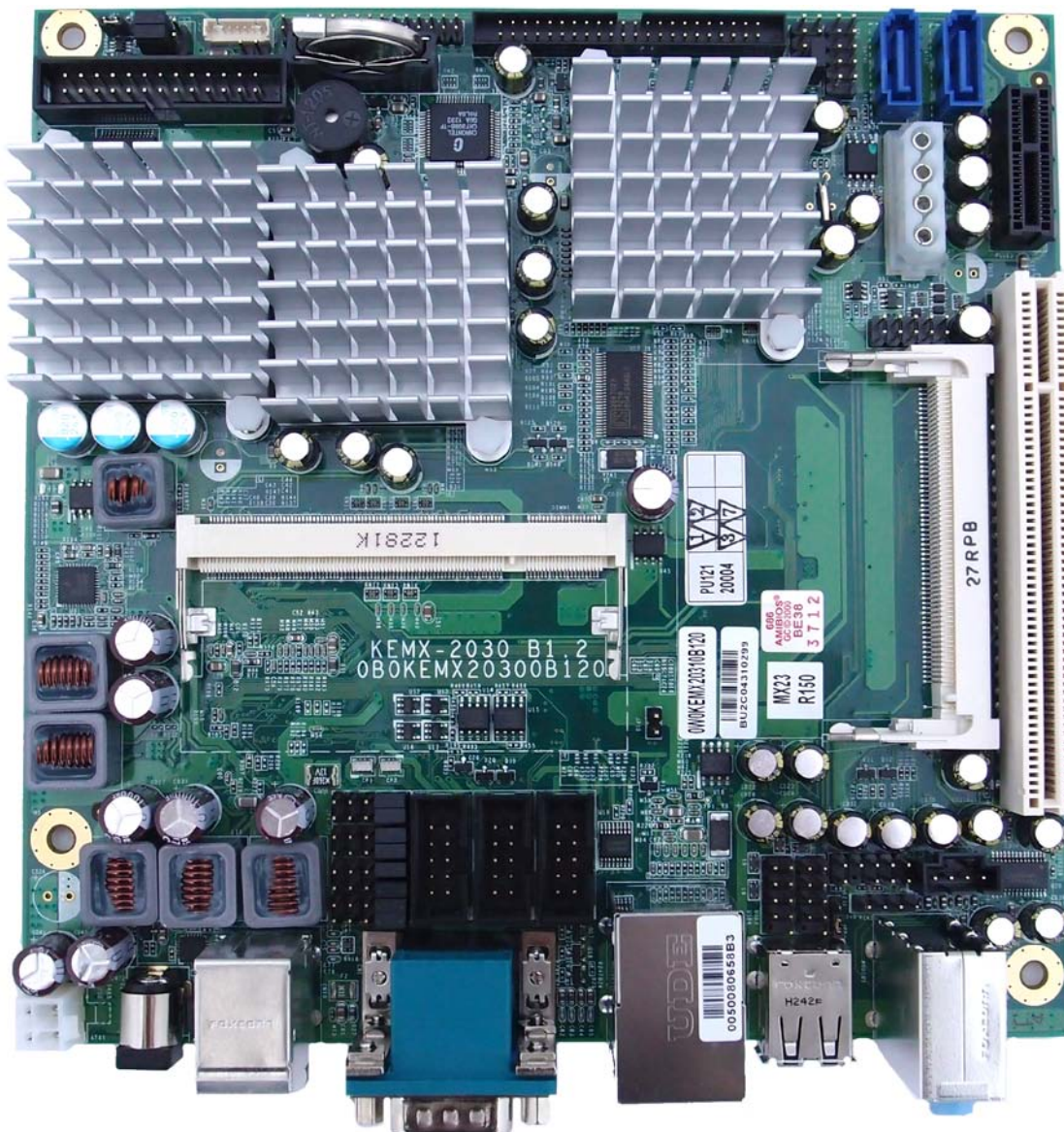


# KEMX-2030

Industrial Motherboard in Mini-ITX form factor  
with Intel® Atom N270

## User's Guide



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*Quanmax reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology.*

*Changes which affect the operation of the unit will be documented in the next revision of this user's guide.*

| <b>Revision</b> | <b>Date</b> | <b>Edited by</b> | <b>Changes</b>                            |
|-----------------|-------------|------------------|-------------------------------------------|
| 1.0             | 12/31/2008  | SLee             | Initial Release                           |
| 1.01            | 2/16/2009   | SLee             | Add LPT                                   |
| 1.02            | 4/06/2009   | SLee             | Add I/O Shield in packing list            |
| 1.03            | 7/27/2009   | SLee             | Add COM1 RS422/485 pin out                |
| 1.04            | 12/16/2009  | SLee             | Correct RS232/422/485 pin assignment      |
| 1.05            | 06/29/2010  | Zack             | Update DIO and Watchdog Timer Sample Code |
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# Safety Instructions

## ■ Before You Begin

Before handling the product, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Quanmax Post-Sales Technical Support.

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### WARNING



High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

---

## ■ When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals.
2. Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3. Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.
4. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

---

### CAUTION



Do not attempt to service the system yourself except as explained in this user's guide. Follow installation and troubleshooting instructions closely.

---

## ■ Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Quanmax strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container

## **Safety Instructions**

or packaging.

- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

# Preface

## ■ How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

---

### NOTE



Driver downloads and additional information are available under Downloads on our web site: [www.quanmax.com](http://www.quanmax.com).

---

## ■ Unpacking

When unpacking, follow these steps:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove all items from the box. If any items listed on the purchase order are missing, notify Quanmax customer service immediately.
3. Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to "Warranty Policy" for the return procedure.

## ■ Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices.

### FCC Compliance Statement for Class A Devices

The product(s) described in this user's guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential

area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

Changes or modifications not expressly approved by Quanmax could void the user's authority to operate the equipment.

---

### NOTE



The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

---

## ■ Warranty Policy

### Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under Support at [www.quanmax.com](http://www.quanmax.com). Please consult your distributor for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever.

Quanmax reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

### Return Procedure

For any Limited Warranty return, please contact Support at [www.quanmax.com](http://www.quanmax.com) and login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to [support@quanmax.com](mailto:support@quanmax.com) to apply for one.

All product(s) returned to Quanmax for service or credit must be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items must be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty must include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the

date of purchase.

To reduce risk of damage, returns of product must be in a Quanmax shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Quanmax Customer Service at a nominal cost. Quanmax owns all parts removed from repaired products. Quanmax uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Quanmax repairs or replaces a product, its warranty term is not extended.

Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

### **Limitation of Liability**

In no event shall Quanmax be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Quanmax's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Quanmax or its authorized agent.

## ■ **Maintaining Your Computer**

### **Environmental Factors**

#### ■ **Temperature**

The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised.

Consideration should be given to the maximum rated ambient temperature.

Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

#### ■ **Humidity**

High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such

properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

### ■ Altitude

Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

## Power Protection

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

### ■ Surge Protector

Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

### ■ Line Conditioner

Line conditioners go beyond the over voltage protection of surge protectors. Line conditioners keep a system’s AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

### ■ Uninterruptible Power Supply

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive units allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

# Chapter 1

## Introduction

### ■ Overview

The KEMX-2030 is a Mini-ITX form factor industrial motherboard combining the latest Intel 45nm Intel® Atom™ processor with the high integration of the Intel® 945GSE/ ICH7-M chipset. The new architecture of Atom™ N270 enable the lowest power consumption and smallest form factor for thin client and fundamental use. Featured are DDR2-400/533 SODIMM up to 2GB, 18/ 24-bit LVDS, Fast Ethernet, SATA 3 Gb/s, PCIe riser for 3x PCIe x1/ PCI/ mini PCI Expansion slot, 8x USB 2.0, 4 COM ports with Power Selection, HD audio, and keyboard/mouse. The KEMX-2030 is a compact, high performance industrial motherboard that is ideal for multimedia, gaming, mobile PC, and thin client applications.

### Checklist

- Driver/ Manual CD
- Quick Installation Guide
- I/O Shield
- KEMX-2030 Mini-ITX Embedded Board
- SATA cable (7-pin connector with lock, L=46cm)

### Features

- Intel® Atom™ Processor N270
- Intel® 945GSE / ICH7-M
- Supports Dual Display, VGA, 18/24-bit LVDS
- DDR2 SO-DIMM Socket, total up to 2 GB
- Mini PCI Socket, PCI slot, PCIe riser for 3x PCIe x1
- 2x SATA 3 Gb/s, 8x USB 2.0, 1x Fast Ethernet (Optional GbE)
- 4x COM ports, 4x DI/DO
- Watchdog Timer, Hardware Monitor, TPM 1.2

## ■ Product Specifications

|                       |                                                                                                                                                                                                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | KEMX-2030`                                                                                                                                                                                           |
| CPU Support           | Intel® Atom™ N270                                                                                                                                                                                    |
| Chipset               | Intel® 945GSE + ICH7-M                                                                                                                                                                               |
| Memory                | 1x DDR2 400/533 SO-DIMM Socket, up to 2GB                                                                                                                                                            |
| BIOS                  | AMI PnP 8Mb SPI ROM                                                                                                                                                                                  |
| Display               | Integrated on Intel® 945GSE Chipset<br>18/24-bit dual-channel LVDS from Chronitel CH7308<br>18-bit Dual channel LVDS from 945GSE optional<br>1x VGA                                                  |
| LAN                   | 1x RJ-45, Fast Ethernet (Realtek RTL8102E) or<br>1x RJ-45, Gigabit Ethernet (Realtek RTL8111C optional)                                                                                              |
| Audio                 | HD Audio Codec, supports Line-in, Line-out & Microphone (Realtek ALC883)<br>Speak-out with AMP. 2x 2W<br>1x S/PDIF                                                                                   |
| Peripheral Support    | 1x IDE (UltraDMA 100 / 66 / 33)<br>2x SATA 3Gb/s<br>4x COMs with Power Selection<br>8x USB 2.0<br>1x PS/2 Keyboard connector<br>1x PS/2 Mouse connector<br>1x Parallel port (Box Header)<br>4x DI/DO |
| TPM                   | TPM 1.2                                                                                                                                                                                              |
| Power Connector       | ATX-4P or DC Jack for 12V Power Input only                                                                                                                                                           |
| Expansion             | 1x PCI slot,<br>1x Mini PCI<br>1x PCIe riser for 3x PCIe x1                                                                                                                                          |
| Watchdog Timer        | 1-255 step, can be set with software on Super I/O                                                                                                                                                    |
| Hardware Monitor      | Operating voltage, CPU temperature and fan speed                                                                                                                                                     |
| Dimensions            | Mini-ITX (170 x 170 mm)                                                                                                                                                                              |
| Environmental Factors | Operation Temp: 0°C - 60°C<br>Storage Temp.: -10°C - 85°C<br>Humidity: 0% - 90%                                                                                                                      |
| Certifications        | CE, FCC Class A                                                                                                                                                                                      |

Table 1 KEMX-2030 Specification

## ■ System Block Diagram

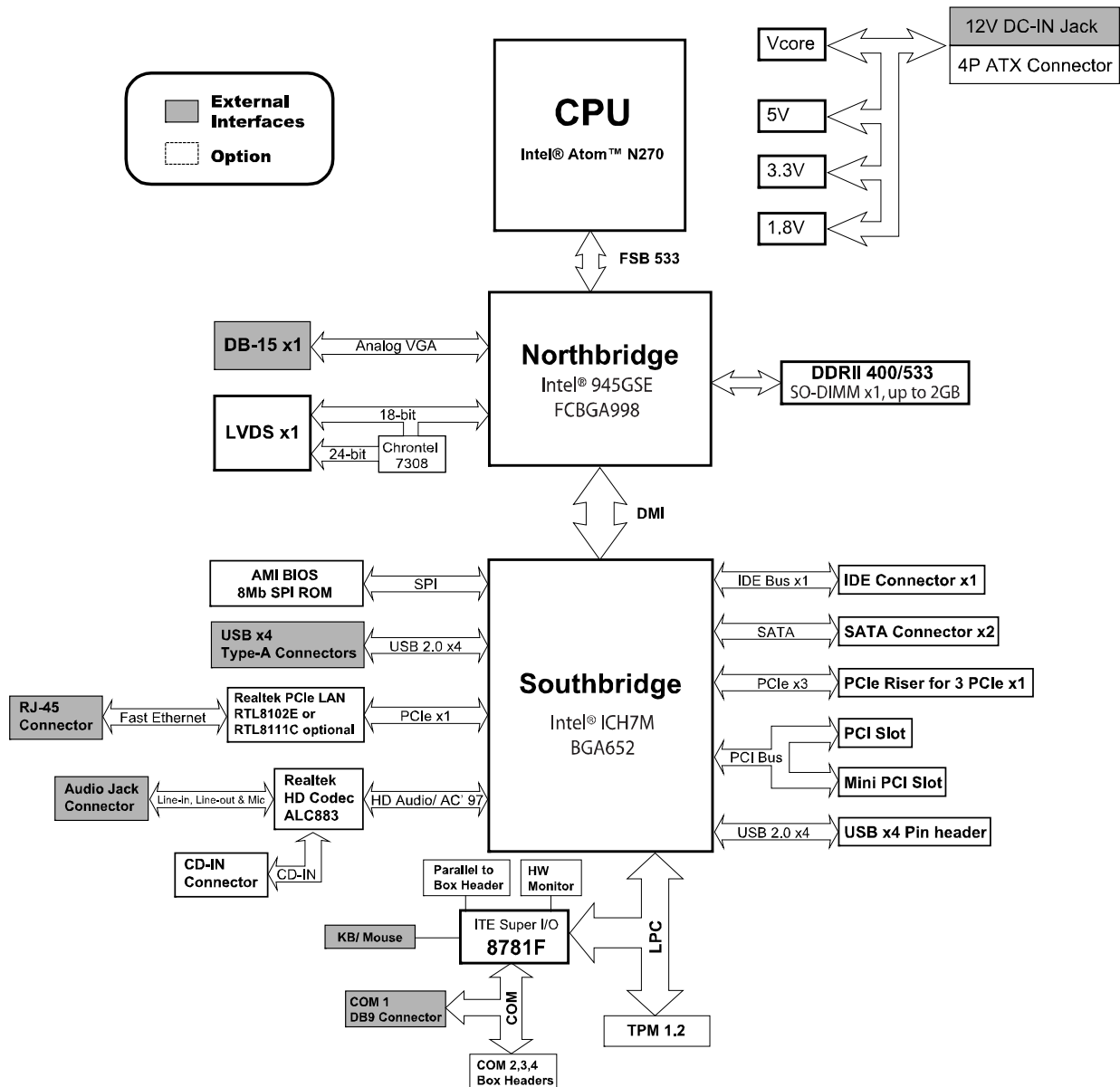


Figure 1 Block Diagram

## ■ Mechanical Dimensions

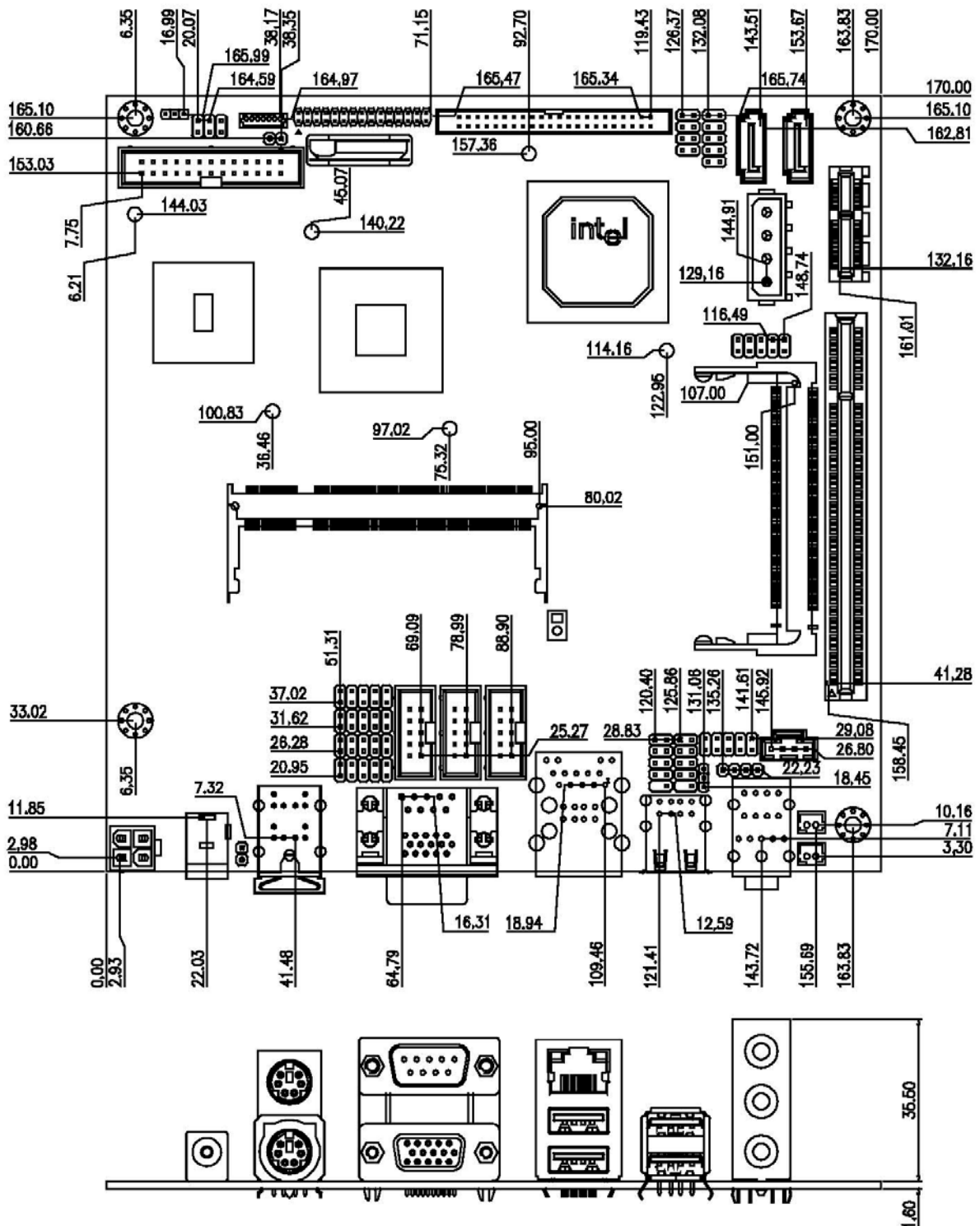


Figure 2 Mechanical Dimensions

## Chapter 2

# Hardware Settings

### ■ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors.

### Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

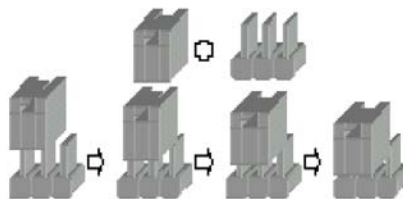


*Figure 3 Jumper Connector*

For a three-pin jumper (see *Figure 3*), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

## ■ Jumper Settings and Pin Definitions

For jumper and connector locations, please refer to the diagrams below.

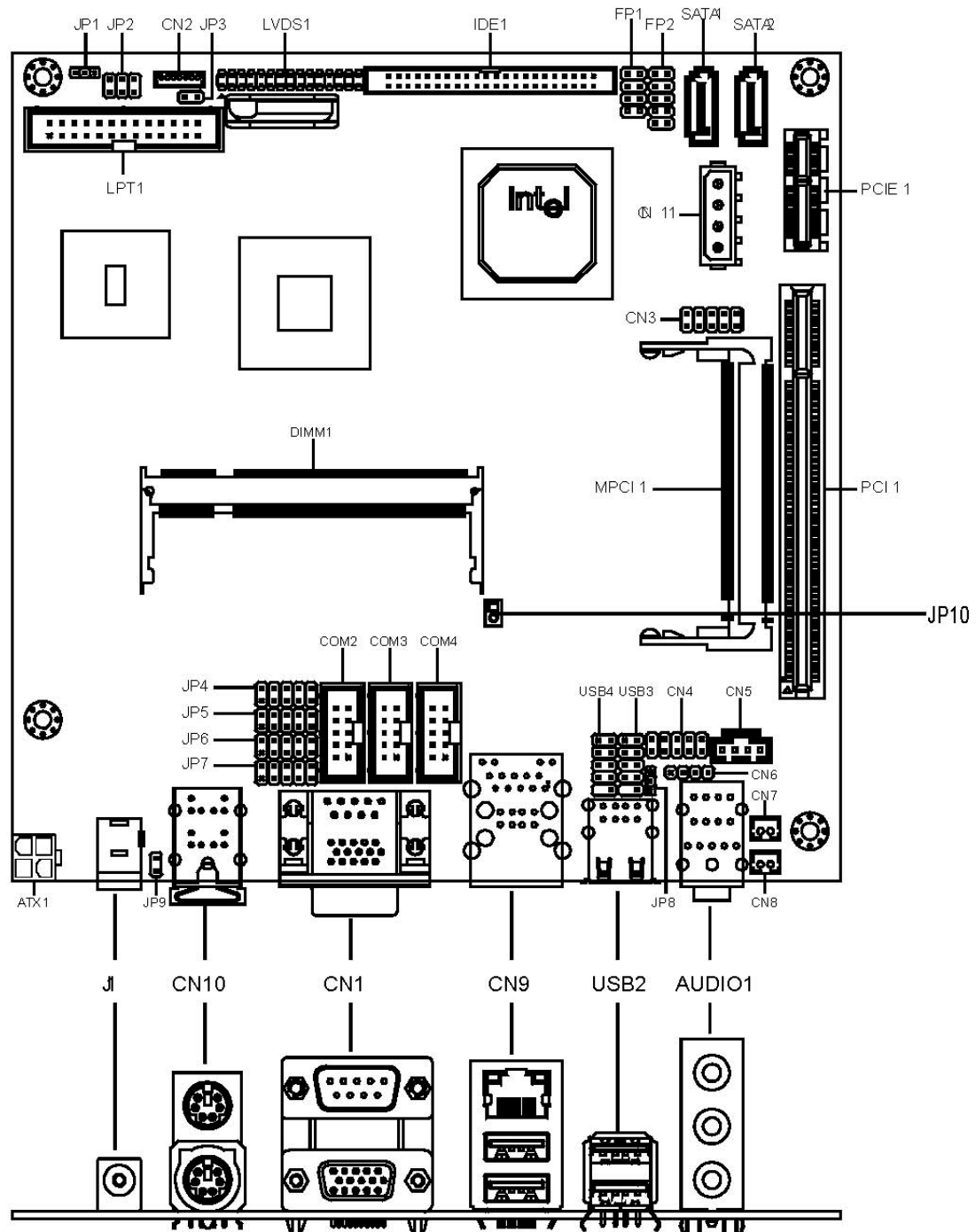


Figure 4 Jumper and Connector Locations

## Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Table 2 Jumper List

| Label | Function                               |
|-------|----------------------------------------|
| JP1   | Backlight Enable Selection             |
| JP2   | Backlight & Panel Power Selection      |
| JP3   | Clear CMOS Selection                   |
| JP4   | COM1 Signal / Power Selection          |
| JP5   | COM2 Signal / Power Selection          |
| JP6   | COM3 Signal / Power Selection          |
| JP7   | COM4 Signal / Power Selection          |
| JP8   | For Quanmax internal test only         |
| JP9   | Power Mode Selection                   |
| JP10  | VGA-Always-On Enable Disable Selection |

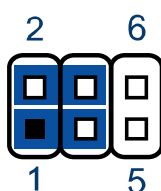
Table 3 JP1 Backlight Enable Selection



| Jumper | Status                |
|--------|-----------------------|
| 1-2    | Active High (Default) |
| 2-3    | Active Low            |

Pitch:2.0mm [YIMTEX 3291\*03SAGR(6T)]

Table 4 JP2 Backlight & Panel Power Selection



| Jumper | Setting | Status                           |
|--------|---------|----------------------------------|
| 1      | 1-3     | Backlight Power = +12V (Default) |
|        | 3-5     | Backlight Power = +5V            |
| 2      | 2-4     | Panel Power = +3.3V (Default)    |
|        | 4-6     | Panel Power = +5V                |

Pitch 2.54mm [YIMTEX 3362\*03SAGR]

Table 5 JP3 Clear CMOS Selection

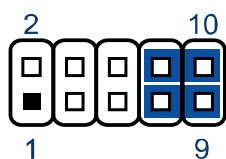


| Jumper | Status                     |
|--------|----------------------------|
| Open   | Normal Operation (Default) |
| Short  | Clear CMOS                 |

Pitch:2.54mm [YIMTEX 3321\*02SAGR(6T)]

**Remark:** You must go to **BIOS EXIT** menu to do “Load Optimal Defaults” after clear CMOS. Please refer to table 52.

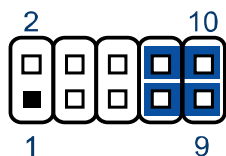
Table 6 JP4 COM1 Signal / Power Selection



| Jumper | Setting    | Function                                                    |
|--------|------------|-------------------------------------------------------------|
| 1      | 1-3 Short  | Pin 1 of COM1 = +12V                                        |
|        | 3-5 Short  | Pin 1 of COM1 = +5V                                         |
|        | 5-7 Short  | Pin 1 of COM1 = +5V                                         |
|        | 7-9 Short  | Pin 1 of COM1 = DCD@RS232, TX-@RS422, DATA-@RS485 (Default) |
| 2      | 2-4 Short  | Pin 9 of COM1 = +12V                                        |
|        | 4-6 Short  | Pin 9 of COM1 = +5V                                         |
|        | 6-8 Short  | Pin 9 of COM1 = +5V                                         |
|        | 8-10 Short | Pin 9 of COM1 = RI (Default)                                |

Pitch: 2.54mm [YIMTEX 3322\*05SAGR(6T)]

Table 7 JP5/ 6/ 7 COM2/ 3/ 4 Signal / Power Selection



| Jumper | Setting    | Function                            |
|--------|------------|-------------------------------------|
| 1      | 1-3 Short  | Pin 1 of COM2/ 3/ 4 = +12V          |
|        | 3-5 Short  | Pin 1 of COM2/ 3/ 4 = +5V           |
|        | 5-7 Short  | Pin 1 of COM2/ 3/ 4 = +5V           |
|        | 7-9 Short  | Pin 1 of COM2/ 3/ 4 = DCD (Default) |
| 2      | 2-4 Short  | Pin 9 of COM2/ 3/ 4 = +12V          |
|        | 4-6 Short  | Pin 9 of COM2/ 3/ 4 = +5V           |
|        | 6-8 Short  | Pin 9 of COM2/ 3/ 4 = +5V           |
|        | 8-10 Short | Pin 9 of COM2/ 3/ 4 = RI (Default)  |

Pitch:2.54mm [YIMTEX 3322\*05SAGR(6T)]

Table 8 JP8 For Quanmax internal test only, do not change default setting



| Jumper | Status           |
|--------|------------------|
| 1-2    | Normal (Default) |
| 2-3    | Debug Mode       |

Pitch: 2.0mm [YIMTEX 3291\*03SAGR(6T)]

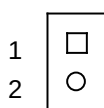
Table 9 JP9 Power Mode Selection



| Jumper | Status             |
|--------|--------------------|
| Open   | ATX Mode (Default) |
| Short  | AT Mode            |

Pitch: 2.54mm [YIMTEX 3321\*02SAGR(6T)]

Table 10 JP10 VGA-Always-On Enable Disable Selection



| Jumper | Status  |
|--------|---------|
| Open   | Enable  |
| Short  | Disable |

Pitch:2.54mm [YIMTEX 3321\*02SAGR(6T)]

## Rear Panel Pin Assignments

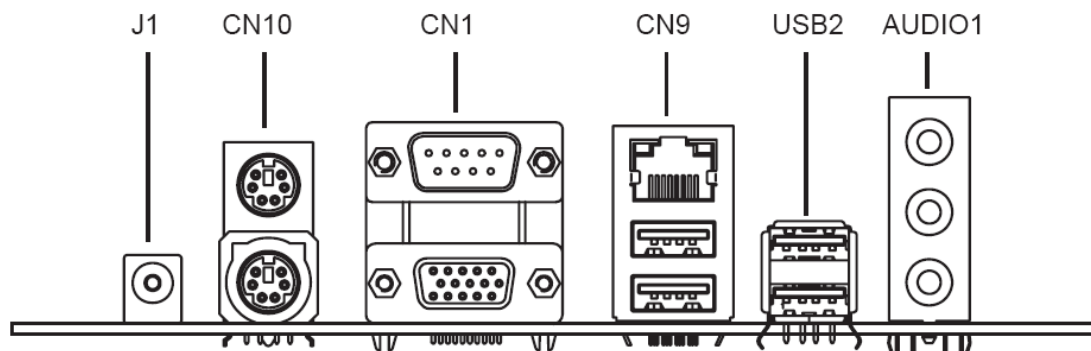


Figure 5 Rear Panel IO

Table 11 Rear Panel Connector List

| Label  | Function                                                            |
|--------|---------------------------------------------------------------------|
| AUDIO1 | 3-Port Audio phone jack                                             |
| USB2   | USB2.0 Port 2 , 3 Type A Connector                                  |
| CN9    | USB2.0 Port 0, 1 Type A Connector & 10/100 Ethernet RJ-45 Connector |
| CN1    | VGA Connector & RS-232(422/485) Port A DB-9 Connector               |
| CN10   | PS/2 KB/MS Connector                                                |
| J1     | +12V Power Input Connector                                          |

Table 12 AUDIO1, 3-Port Audio phone jack

|  | Blue  |             |
|--|-------|-------------|
|  | Green |             |
|  | Pink  |             |
|  |       |             |
|  |       | Signal Name |
|  | BLUE  | LINE IN     |
|  | GREEN | LINE OUT    |
|  | PINK  | MIC IN      |

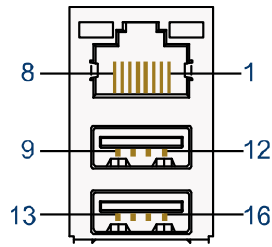
AUDIO JACK\*3 DIP Vertical [Foxconn JA33331-H11P-4F]

Table 13 USB2, USB2.0 Port 2, 3 Type A Connector

|  | Pin | Signal Name | Pin | Signal Name |
|--|-----|-------------|-----|-------------|
|  | 1   | +5V         | 5   | +5V         |
|  | 2   | USB1-       | 6   | USB0-       |
|  | 3   | USB1+       | 7   | USB0+       |
|  | 4   | GND         | 8   | GND         |

USB DIP 4\*2P 90D [KUON YI KS-002-ANB-L]

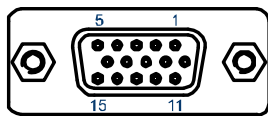
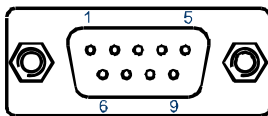
Table 14 CN9, USB2.0 Port 0, 1 Connector &amp; Ethernet RJ-45 Connector



| Pin | Signal  | Pin | Signal |
|-----|---------|-----|--------|
| 1   | MDI[0]+ | U1  | +5V    |
| 2   | MDI[0]- | U2  | USB0-  |
| 3   | MDI[1]+ | U3  | USB0+  |
| 4   | MDI[1]- | U4  | GND    |
| 5   | MDI[2]+ | U5  | +5V    |
| 6   | MDI[2]- | U6  | USB1-  |
| 7   | MDI[3]+ | U7  | USB1+  |
| 8   | MDI[3]- | U8  | GND    |

USB\*2/RJ45\*1+TFM+LED(10/100)22P DIP 90° [UDE RU1-161A1Z1F(XB)]

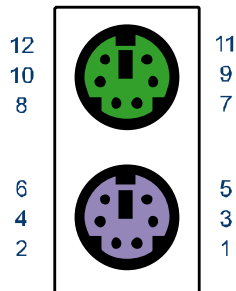
Table 15 CN1, VGA Connector &amp; RS-232(422/485) Port A DB-9 Connector



| Pin         | RS232                    | RS422 (COM1*) | RS485 Half Duplex (COM1*) |
|-------------|--------------------------|---------------|---------------------------|
| 1           | DCD, Data carrier detect | TX-           | DATA-                     |
| 2           | RXD, Receive data        | RX+           | N/A                       |
| 3           | TXD, Transmit data       | TX+           | DATA+                     |
| 4           | DTR, Data terminal ready | RX-           | N/A                       |
| 5           | GND, ground              |               |                           |
| 6           | DSR, Data set ready      |               |                           |
| 7           | RTS, Request to send     |               |                           |
| 8           | CTS, Clear to send       |               |                           |
| 9           | RI, Ring indicator       |               |                           |
| Signal Name | Pin                      | Pin           | Signal Name               |
| Red         | 1                        | 2             | Green                     |
| Blue        | 3                        | 4             | NC                        |
| GND         | 5                        | 6             | GND                       |
| GND         | 7                        | 8             | GND                       |
| VCC         | 9                        | 10            | GND                       |
| NC          | 11                       | 12            | DDC2B data                |
| HSYNC       | 13                       | 14            | VSYSN                     |
| DDC2B clock | 15                       |               |                           |

D-SUB 9P(M)&15S(19.05mm(F) FOR PC99 FOLLOW PANTONE  
COLOR[ D201B1N01002N]

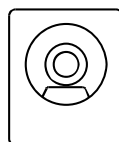
Table 16 CN 10, PS/2 KB/MS Connector



| Pin | Signal | Function           |
|-----|--------|--------------------|
| 1   | KBDAT  | Keyboard Data      |
| 2   | NC     | No Connect         |
| 3   | GND    | Ground             |
| 4   | KB5V   | +5VSB Power Source |
| 5   | KBCLK  | Keyboard Clock     |
| 6   | NC     | No Connect         |
| 7   | MSDAT  | Mouse Data         |
| 8   | NC     | No Connect         |
| 9   | GND    | Ground             |
| 10  | KB5V   | +5VSB Power Source |
| 11  | MSCLK  | Mouse Clock        |
| 12  | NC     | No Connect         |

MINI DIN DIP 6/6P MH11061-P36-4F 90D(F) Kb/Ms for PC99 CONNECTOR  
[FOXCONN]

Table 17 J1, +12V Power Input Connector



| Pin | Signal |
|-----|--------|
| 1   | NC     |
| 2   | +12V   |
| 3   | GND    |

DC POWER DIP 3PIN  $\phi$  2.5mm 90° [KUON YI KD-014SA-L]



#### NOTE

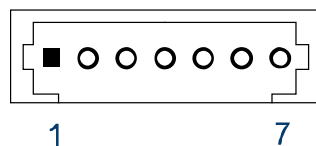
Do not use J1 & ATX1 connectors at the same time.

## Main Board Pin Assignments

Table 18 Internal Connector List

| Label | Function                          |
|-------|-----------------------------------|
| CN2   | Panel Backlight Wafer             |
| CN3   | Digital Input / Output Pin Header |
| CN4   | Front Panel Audio Pin Header      |
| CN5   | CD-In Connector Pin Header        |
| CN6   | S/PDIF Pin Header                 |
| CN7   | Audio AMP Right Output Wafer      |
| CN8   | Audio AMP Left Output Wafer       |
| CN11  | AT Power Wafer                    |
| DIMM1 | DDR2 Memory SO-DIMM Socket        |
| FP1   | Front Panel 1 Pin Header          |
| FP2   | Front Panel 2 Pin Header          |
| LVDS1 | LVDS Panel Pin Header             |
| IDE1  | 44PIN 2.0mm Pin Header            |
| SATA1 | Serial ATA Connector              |
| SATA2 | Serial ATA Connector              |
| USB3  | USB2.0 Port 4, 5 Pin Header       |
| USB4  | USB2.0 Port 6, 7 Pin Header       |
| COM2  | RS-232 Port 2 With Power Wafer    |
| COM3  | RS-232 Port 3 With Power Wafer    |
| COM4  | RS-232 Port 4 With Power Wafer    |
| PCIE1 | PCIE slots                        |
| MPCI1 | Mini PCI slots                    |
| PCI1  | PCI slots                         |
| ATX1  | +12V Power Input Connector        |
| LPT1  | Parallel Port Wafer               |

Table 19 CN2, Panel Backlight Wafer



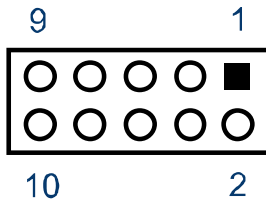
| Pin | Signal Name      |
|-----|------------------|
| 7   | NC               |
| 6   | BL_ADJ           |
| 5   | GND              |
| 4   | +5V / +12V *     |
| 3   | +5V / +12V *     |
| 2   | GND              |
| 1   | BL_EN / BL_EN# * |

\* : Selected by JP2

\*\* : Selected by JP1

Pitch:1.25mm WAFER [YIMTEX 501MW1\*7STR]

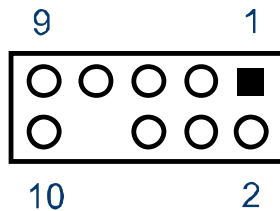
Table 20 CN3, Digital Input / Output Pin Header



| Pin | Signal           | Pin | Signal          |
|-----|------------------|-----|-----------------|
| 1   | Digital Output 0 | 2   | Digital Input 0 |
| 3   | Digital Output 1 | 4   | Digital Input 1 |
| 5   | Digital Output 2 | 6   | Digital Input 2 |
| 7   | Digital Output 3 | 8   | Digital Input 3 |
| 9   | +5V              | 10  | GND             |

Pitch:2.54mm [YIMTEX 3322\*05SAGR(6T)]

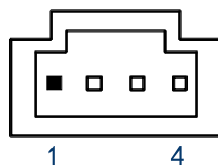
Table 21 CN4, Front Panel Audio Pin Header



| Pin | Signal    | Pin | Signal    |
|-----|-----------|-----|-----------|
| 1   | MIC2-L    | 2   | Audio GND |
| 3   | MIC2-R    | 4   | ACZ_DET#  |
| 5   | Line2-R   | 6   | MIC2_JD   |
| 7   | FIO_Sense | 8   | Key       |
| 9   | Line2-L   | 10  | Line2_JD  |

Pitch:2.54mm w/o Pin 8 [YIMTEX 3322\*05SAGR(6T)-08]

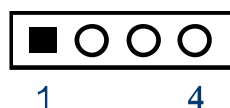
Table 22 CN5, CD-In Connector



| Pin      | Signal Name    |
|----------|----------------|
| <u>1</u> | <u>CD-IN-R</u> |
| <u>2</u> | <u>GND</u>     |
| <u>3</u> | <u>GND</u>     |
| <u>4</u> | <u>CD-IN-L</u> |

Pitch:2.54mm WAFER [YIMTEX 522CW4SGR]

Table 23 CN6, S/PDIF Pin Header



| Pin | Signal Name |
|-----|-------------|
| 1   | S/PDIF In   |
| 2   | GND         |
| 3   | S/PDIF Out  |
| 4   | GND         |

Pitch:2.54mm [YIMTEX 3321\*04SAGR(6T)]

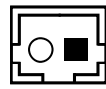
Table 24 CN7, Audio AMP Right Output Wafer



| Pin | Signal Name |
|-----|-------------|
| 1   | Speaker+    |
| 2   | Speaker-    |

Pitch=2.0mm WAFER [YIMTEX 503PW1\*02STR]

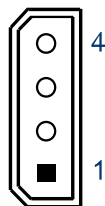
Table 25 CN8, Audio AMP Left Output Wafer



| Pin | Signal Name |
|-----|-------------|
| 1   | Speaker+    |
| 2   | Speaker-    |

Pitch=2.0mm WAFER [YIMTEX 503PW1\*02STR]

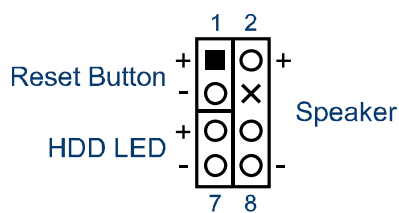
Table 26 CN11, AT Power Output Wafer



| Pin | Signal Name |
|-----|-------------|
| 1   | +12V        |
| 2   | GND         |
| 3   | GND         |
| 4   | +5V         |

Pitch: 5.08mm W/O LOCK [VENSİK 2470-F-04PST-PB]

Table 27 FP1, Front Panel 1 Pin Header



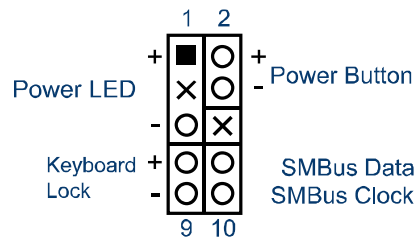
| Pin | Signal         | Pin | Signal    |
|-----|----------------|-----|-----------|
| 1   | Reset Button + | 2   | Speaker + |
| 3   | Reset Button - | 4   | NC        |
| 5   | HDD LED +      | 6   | NC        |
| 7   | HDD LED -      | 8   | Speaker - |

Pins 2, 8: External Speaker wire

Pins 6-8 shorted: Internal Speaker Enable (default)

Pitch:2.54mm [YIMTEX 3322\*04SAGR(6T)]

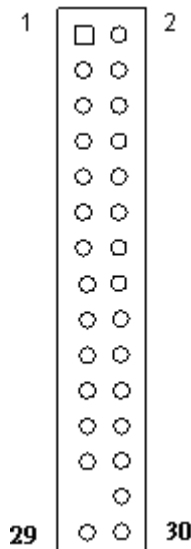
Table 28 FP2, Front Panel 2 Pin Header



| Pin | Signal        | Pin | Signal         |
|-----|---------------|-----|----------------|
| 1   | Power LED +   | 2   | Power Button + |
| 3   | NC            | 4   | Power Button - |
| 5   | Power LED -   | 6   | NC             |
| 7   | Keyboard Lock | 8   | SMBus Data     |
| 9   | GND           | 10  | SMBus Clock    |

Pitch:2.54mm [YIMTEX 3322\*05SAGR(6T)]

Table 29 LVDS1, LVDS Panel Connector

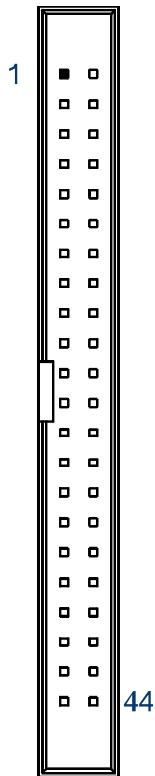


| Pin | Signal Name   | Pin | Signal Name   |
|-----|---------------|-----|---------------|
| 1   | NC            | 2   | NC            |
| 3   | LVDS_A0-      | 4   | LVDS_A0+      |
| 5   | LVDS_A1-      | 6   | LVDS_A1+      |
| 7   | LVDS_A2-      | 8   | LVDS_A2+      |
| 9   | LVDS_ACK-     | 10  | LVDS_ACK+     |
| 11  | LVDS_A3-      | 12  | LVDS_A3+      |
| 13  | GND           | 14  | GND           |
| 15  | LVDS_B0-      | 16  | LVDS_B0+      |
| 17  | LVDS_B1-      | 18  | LVDS_B1+      |
| 19  | LVDS_B2-      | 20  | LVDS_B2+      |
| 21  | LVDS_BCK-     | 22  | LVDS_BCK+     |
| 23  | LVDS_B3-      | 24  | LVDS_B3+      |
| 25  | NC            | 26  | GND           |
| 27  | NC            | 28  | +3.3V / +5V * |
| 29  | +3.3V / +5V * | 30  | +3.3V / +5V * |

\* : Selected by JP2

Pitch:2.0mm CUT27 [YIMTEX 3292\*15SAGR(6T)-27]

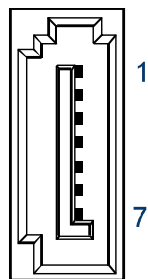
Table 30 IDE1, Primary 44-pin IDE Box Header



| Signal Name        | Pin | Pin | Signal Name        |
|--------------------|-----|-----|--------------------|
| Reset IDE          | 1   | 2   | GND                |
| IDE Data 7         | 3   | 4   | IDE Data 8         |
| IDE Data 6         | 5   | 6   | IDE Data 9         |
| IDE Data 5         | 7   | 8   | IDE Data 10        |
| IDE Data 4         | 9   | 10  | IDE Data 11        |
| IDE Data 3         | 11  | 12  | IDE Data 12        |
| IDE Data 2         | 13  | 14  | IDE Data 13        |
| IDE Data 1         | 15  | 16  | IDE Data 14        |
| IDE Data 0         | 17  | 18  | IDE Data 15        |
| Ground             | 19  | 20  | NC                 |
| DREQ0              | 21  | 22  | GND                |
| IDEIOW#            | 23  | 24  | GND                |
| IDEIOR#            | 25  | 26  | GND                |
| IDEIORDY           | 27  | 28  | CBSEL              |
| DACK0#             | 29  | 30  | GND                |
| IDEIRQ14           | 31  | 32  | NC                 |
| IDE Address 1      | 33  | 34  | PDIAG#             |
| IDE Address 0      | 35  | 36  | IDE Address 2      |
| IDE Chip select 1# | 37  | 38  | IDE Chip select 3# |
| IDE activity       | 39  | 40  | GND                |
| +5V                | 41  | 42  | +5V                |
| GND                | 43  | 44  | NC                 |

Pitch:2.0mm [YIMTEX 32644SAGR(6T)]

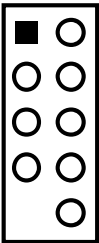
Table 31 SATA1,2, SATA Connector



| Pin | Signal Name |
|-----|-------------|
| 1   | GND         |
| 2   | TX+         |
| 3   | TX-         |
| 4   | GND         |
| 5   | RX-         |
| 6   | RX+         |
| 7   | GND         |

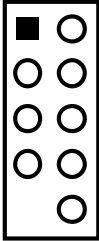
SATA WATM-07ABN4B2B8UW4 [WIN WIN]

Table 32 USB3, USB2.0 Port 4, 5 Pin Header

|   |                                                                                   |   |     |             |     |             |
|---|-----------------------------------------------------------------------------------|---|-----|-------------|-----|-------------|
| 1 |  | 2 | Pin | Signal Name | Pin | Signal Name |
|   |                                                                                   |   | 1   | +5V         | 2   | +5V         |
|   |                                                                                   |   | 3   | USB4-       | 4   | USB5-       |
|   |                                                                                   |   | 5   | USB4+       | 6   | USB5+       |
|   |                                                                                   |   | 7   | GND         | 8   | GND         |
|   |                                                                                   |   | 9   | KEY         | 10  | GND         |

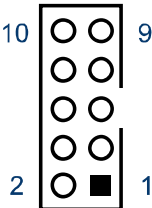
Pitch:2.54mm [YIMTEX 3322\*05SAGR(6T) -09]

Table 33 USB4, USB2.0 Port 6, 7 Pin Header

|   |                                                                                    |   |     |             |     |             |
|---|------------------------------------------------------------------------------------|---|-----|-------------|-----|-------------|
| 1 |  | 2 | Pin | Signal Name | Pin | Signal Name |
|   |                                                                                    |   | 1   | +5V         | 2   | +5V         |
|   |                                                                                    |   | 3   | USB6-       | 4   | USB7-       |
|   |                                                                                    |   | 5   | USB6+       | 6   | USB7+       |
|   |                                                                                    |   | 7   | GND         | 8   | GND         |
|   |                                                                                    |   | 9   | KEY         | 10  | GND         |

Pitch:2.54mm [YIMTEX 3322\*05SAGR(6T) -09]

Table 34 COMx RS-232 Port-x Box Header (x = 2, 3, 4)

|                                                                                     |            |                                                                 |
|-------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------|
|  | <b>Pin</b> | <b>Signal</b>                                                   |
|                                                                                     | 1          | +5V / +12V / DCD, Data carrier detect<br>Note : Selected by JPx |
|                                                                                     | 2          | RXD, Receive data                                               |
|                                                                                     | 4          | DTR, Data terminal ready                                        |
|                                                                                     | 5          | GND, ground                                                     |
|                                                                                     | 3          | TXD, Transmit data                                              |
|                                                                                     | 6          | DSR, Data set ready                                             |
|                                                                                     | 7          | RTS, Request to send                                            |
|                                                                                     | 8          | CTS, Clear to send                                              |
|                                                                                     | 9          | +5V / +12V / RI, Ring indicator<br>Note : Selected by JPx       |
|                                                                                     | 10         | NC                                                              |

Pitch:2.54mm [YIMTEX 32510SAG1R(6T)]

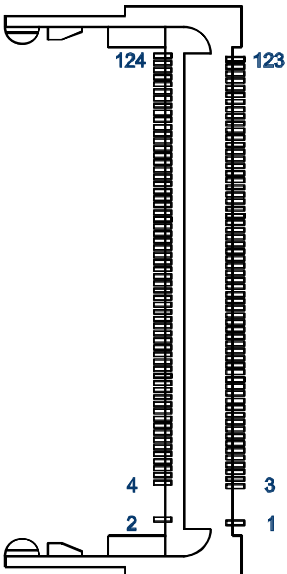
Table 35 PCIE1 PCIE slots

| PCIE slots |            |              |
|------------|------------|--------------|
| Pin        | Side B     | Side A       |
| 1          | 12V        | 3.3V         |
| 2          | 12V        | 3.3V         |
| 3          | 3.3VSB     | Ground       |
| 4          | PCIE_WAKE# | CLK100_PCIE+ |
| 5          | PCI_RST#   | CLK100_PCIE- |
| 6          | Ground     | Ground       |
| 7          | PCIE_TXP2  | PCIE_RXP2    |
| 8          | PCIE_TXN2  | PCIE_RXN2    |
| 9          | Ground     | Ground       |
| 10         | PCIE_TXP3  | PCIE_RXP3    |
| 11         | PCIE_TXN3  | PCIE_RXN3    |
| 12         | Ground     | Ground       |
| 13         | Ground     | Ground       |
| 14         | NC         | NC           |
| 15         | NC         | NC           |
| 16         | Ground     | Ground       |
| 17         | NC         | NC           |
| 18         | NC         | NC           |

PCI 18\*2P EXPRESS 180D(F) Black [ Win Win WPES--036AN41B22UWS]

Table 36 MPC11, Mini-PCI Socket

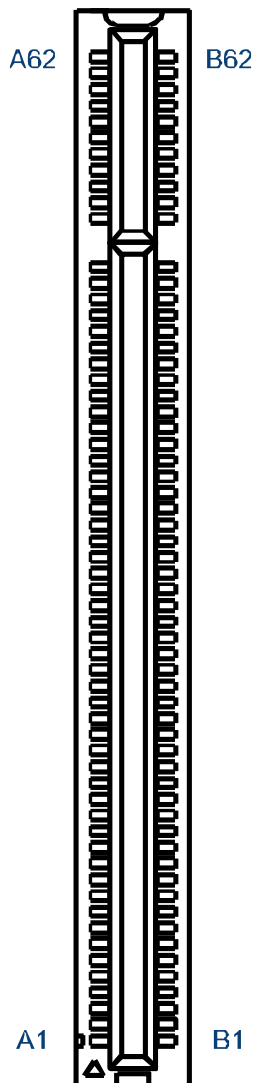
| Pin | Signal | Pin | Signal   |
|-----|--------|-----|----------|
| 1   | NC     | 2   | NC       |
| 3   | NC     | 4   | NC       |
| 5   | NC     | 6   | NC       |
| 7   | NC     | 8   | NC       |
| 9   | NC     | 10  | NC       |
| 11  | NC     | 12  | NC       |
| 13  | NC     | 14  | NC       |
| 15  | GND    | 16  | NC       |
| 17  | INTA#  | 18  | +5V      |
| 19  | +3.3V  | 20  | INTD#    |
| 21  | NC     | 22  | NC       |
| 23  | GND    | 24  | +3.3V_SB |
| 25  | PCICLK | 26  | RST#     |
| 27  | GND    | 28  | +3.3V    |
| 29  | REQ#   | 30  | GNT#     |
| 31  | +3.3V  | 32  | GND      |



|     |       |     |         |
|-----|-------|-----|---------|
| 33  | AD31  | 34  | PME#    |
| 35  | AD29  | 36  | NC      |
| 37  | GND   | 38  | AD30    |
| 39  | AD27  | 40  | +3.3V   |
| 41  | AD25  | 42  | AD28    |
| 43  | NC    | 44  | AD26    |
| 45  | CBE3# | 46  | AD24    |
| 47  | AD23  | 48  | IDSEL   |
| 49  | GND   | 50  | GND     |
| 51  | AD21  | 52  | AD22    |
| 53  | AD19  | 54  | AD20    |
| 55  | GND   | 56  | PAR     |
| 57  | AD17  | 58  | AD18    |
| 59  | CBE2# | 60  | AD16    |
| 61  | IRDY# | 62  | GND     |
| 63  | +3.3V | 64  | FRAME#  |
| 65  | NC    | 66  | TRDY#   |
| 67  | SERR# | 68  | STOP#   |
| 69  | GND   | 70  | +3.3V   |
| 71  | PERR# | 72  | DEVSEL# |
| 73  | CBE1# | 74  | GND     |
| 75  | AD14  | 76  | AD15    |
| 77  | GND   | 78  | AD13    |
| 79  | AD12  | 80  | AD11    |
| 81  | AD10  | 82  | GND     |
| 83  | GND   | 84  | AD9     |
| 85  | AD8   | 86  | CBE0#   |
| 87  | AD7   | 88  | +3.3V   |
| 89  | +3.3V | 90  | AD6     |
| 91  | AD5   | 92  | AD4     |
| 93  | NC    | 94  | AD2     |
| 95  | AD3   | 96  | AD0     |
| 97  | +5V   | 98  | NC      |
| 99  | AD1   | 100 | NC      |
| 101 | GND   | 102 | GND     |
| 103 | NC    | 104 | GND     |
| 105 | NC    | 106 | NC      |
| 107 | NC    | 108 | NC      |
| 109 | NC    | 110 | NC      |
| 111 | NC    | 112 | NC      |
| 113 | NC    | 114 | GND     |
| 115 | NC    | 116 | NC      |
| 117 | NC    | 118 | NC      |
| 119 | NC    | 120 | NC      |
| 121 | NC    | 122 | NC      |
| 123 | +5V   | 124 | +3.3V   |

MINIPCI [FOXCONN AS0B126-S99N-4F]

Table 37 PCI1, PCI slots

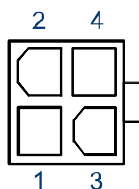


| 5V Board PCI Revision 2.1 |           |              |              |
|---------------------------|-----------|--------------|--------------|
| Pin                       | Side B    | Side A       | Comments     |
| 1                         | -12V      | TRST_L       | 32-bit start |
| 2                         | TCK       | +12V         |              |
| 3                         | Ground    | TMS          |              |
| 4                         | TDO       | TDI          |              |
| 5                         | +5V       | +5V          |              |
| 6                         | +5V       | INTA_L       |              |
| 7                         | INTB_L    | INTC_L       |              |
| 8                         | INTD_L    | +5V          |              |
| 9                         | PRSNT1_L  | Reserved     |              |
| 10                        | Reserved  | +5V          |              |
| 11                        | PRSNT2_L  | Reserved     |              |
| 12                        | Ground    | Ground       | 3.3V key     |
| 13                        | Ground    | Ground       | 3.3V key     |
| 14                        | Reserved  | Reserved     |              |
| 15                        | Ground    | RST_L        |              |
| 16                        | CLK       | +5V          |              |
| 17                        | Ground    | GNT_L        |              |
| 18                        | REQ_L     | Ground       |              |
| 19                        | +5V       | Reserved     |              |
| 20                        | AD[31]    | AD[30]       |              |
| 21                        | AD[29]    | +3.3V        |              |
| 22                        | Ground    | AD[28]       |              |
| 23                        | AD[27]    | AD[26]       |              |
| 24                        | AD[25]    | Ground       |              |
| 25                        | +3.3V     | AD[24] +3.3V |              |
| 26                        | C/BE[3]_L | IDSEL        |              |
| 27                        | AD[23]    | +3.3V        |              |
| 28                        | Ground    | AD[22]       |              |
| 29                        | AD[21]    | AD[20]       |              |
| 30                        | AD[19]    | Ground       |              |
| 31                        | +3.3V     | AD[18]       |              |
| 32                        | AD[17]    | AD[16]       |              |
| 33                        | C/BE[2]_L | +3.3V        |              |
| 34                        | Ground    | FRAME_L      |              |
| 35                        | IRDY_L    | Ground       |              |
| 36                        | +3.3V     | TRDY_L       |              |
| 37                        | DEVSEL_L  | Ground       |              |
| 38                        | Ground    | STOP_L       |              |
| 39                        | LOCK_L    | +3.3V        |              |
| 40                        | PERR_L    | Reserved     |              |
| 41                        | +3.3V     | Reserved     |              |
| 42                        | SERR_L    | Ground       |              |
| 43                        | +3.3V     | PAR          |              |
| 44                        | C/BE[1]_L | AD[15]       |              |
| 45                        | AD[14]    | +3.3V        |              |
| 46                        | Ground    | AD[13]       |              |
| 47                        | AD[12]    | AD[11]       |              |
| 48                        | AD[10]    | Ground       |              |
| 49                        | Ground    | AD[09]       |              |

| 5V Board PCI Revision 2.1 |         |           |            |
|---------------------------|---------|-----------|------------|
| Pin                       | Side B  | Side A    | Comments   |
| 50                        | KEYWAY  | KEYWAY    | 5V key     |
| 51                        | KEYWAY  | KEYWAY    | 5V key     |
| 52                        | AD[08]  | C/BE[0]_L |            |
| 53                        | AD[07]  | +3.3V     |            |
| 54                        | +3.3V   | AD[06]    |            |
| 55                        | AD[05]  | AD[04]    |            |
| 56                        | AD[03]  | Ground    |            |
| 57                        | Ground  | AD[02]    |            |
| 58                        | AD[01]  | AD[00]    |            |
| 59                        | +5V     | +5V       |            |
| 60                        | ACK64_L | REQ64_L   |            |
| 61                        | +5V     | +5V       |            |
| 62                        | +5V     | +5V       | 32-bit end |

PCI 60\*2P 180D (F) [FOXCONN EH06001-DAW-DF]

Table 38 ATX1, +12V Power Input Connector



| Pin | Signal Name |
|-----|-------------|
| 1   | GND         |
| 2   | GND         |
| 3   | +12V        |
| 4   | +12V        |

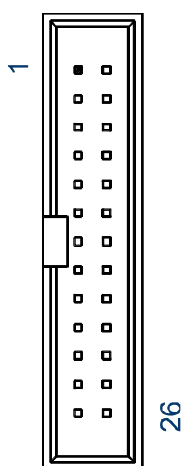
Pitch:4.2mm [YIMTEX 576MWA2\*02STR]



#### NOTE

Do not use J1 & ATX1 connectors at the same time.

Table 39 Parallel Port Wafer



| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | STB         | 2   | #AFD        |
| 3   | PD0         | 4   | #ERR        |
| 5   | PD1         | 6   | #INIT       |
| 7   | PD2         | 8   | #SLIN       |
| 9   | PD3         | 10  | GND         |
| 11  | PD4         | 12  | GND         |
| 13  | PD5         | 14  | GND         |
| 15  | PD6         | 16  | GND         |
| 17  | PD7         | 18  | GND         |
| 19  | #ACK        | 20  | GND         |
| 21  | BUSY        | 22  | GND         |
| 23  | PE          | 24  | GND         |
| 25  | SLCT        | 26  | GND         |

Pitch:2.54mm [YIMTEX 32526SAG1R(6T)]

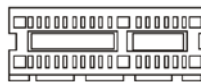
## Chapter 3

# System Installation

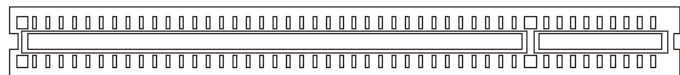
### ■ Expansive Interfaces

The board comes with one PClex1 slot , one PCI slot and one Mini-PCI interface.

1x PCIe riser for 3x PCIe x1



32-bit, 33MHz PCI slot



32-bit, 33MHz Mini-PCI socket

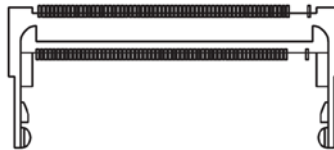


*Figure 6 Expansive Interfaces*

#### NOTE



When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

### ■ Memory Module Installation

**Carefully follow the steps below in order to install the DIMMs:**

1. To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.
2. Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.

3. To make sure the correct DDR2 SO-DIMM notches should match with the DDR2 SO-DIMM.
4. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it at a 30-degree angle into the socket.

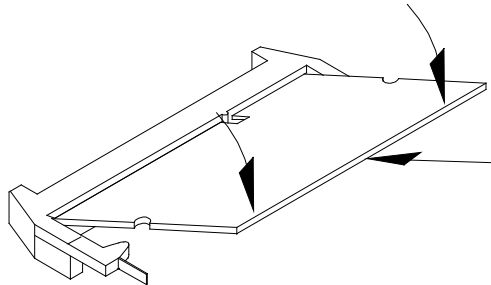


*Figure 7 Align the SO-DIMM Memory Module with the onboard socket*

5. Fully insert the module into the socket until a “click” is heard.
6. Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module

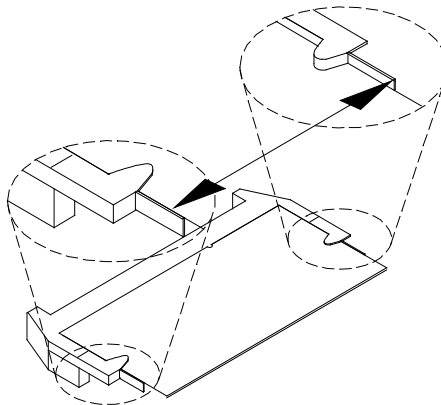


*Figure 8 Press down on the SO-DIMM Memory Module to lock it in place*

### Removing a DIMM:

To remove the SO-DIMM, use your fingers or a small screwdriver to carefully push away the tabs that secure either side of the SO-DIMM. Lift it out of the socket. Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

## Chapter 4

# AMI BIOS Setup

### ■ Overview

This chapter provides a description of the AMI BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.



**NOTE:** The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax

---

AMI's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

## ■ Main Menu

The BIOS Setup is accessed by pressing the DEL key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the “<” and “>” cursor keys to navigate between menu screens.

Table 40 BIOS Main Menu

| BIOS SETUP UTILITY                                       |          |      |         |                                                                                                                               |          |                                                            |
|----------------------------------------------------------|----------|------|---------|-------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------|
| Main                                                     | Advanced | Boot | Chipset | Power                                                                                                                         | Security | Exit                                                       |
| System Date                                              |          |      |         | [Wed 11/05/2008]                                                                                                              |          | Use [ENTER], [TAB]<br>or [SHIFT-TAB] to<br>select a field. |
| System Time                                              |          |      |         | [10:18:15]                                                                                                                    |          |                                                            |
| > Primary IDE Master                                     |          |      |         | :[Not Detected]                                                                                                               |          | Use [+] or [-] to<br>configure system Time.                |
| > Primary IDE Slave                                      |          |      |         | :[Not Detected]                                                                                                               |          |                                                            |
| > Secondary IDE Master                                   |          |      |         | :[Not Detected]                                                                                                               |          |                                                            |
| > Secondary IDE Slave                                    |          |      |         | :[Not Detected]                                                                                                               |          |                                                            |
| > System Information                                     |          |      |         | <> Select Screen<br>↑↓ Select Item<br>+- Change Field<br>Tab Select Field<br>F1 General Help<br>F10 Save and Exit<br>ESC Exit |          |                                                            |
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Below table is described for Primary IDE Master, Primary IDE Slave, Secondary IDE Master, and Secondary IDE Slave setting.

Table 41 IDE Device Setting Menu

| BIOS SETUP UTILITY                                                                                                                                                                                                                                                                                                                                                 |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Main                                                                                                                                                                                                                                                                                                                                                               |  |
| <div>Primary Master</div> <div>Device:Not Detected</div>                                                                                                                                                                                                                                                                                                           |  |
| <div>LBA/ Large Mode[Auto]</div> <div>DMA Mode[Auto]</div> <div>S.M.A.R.T[Auto]</div>                                                                                                                                                                                                                                                                              |  |
| <div>Disable: Disables LBA Mode.</div> <div>Auto: Enables LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled.</div> <div>&lt;&gt; Select Screen</div> <div>↑↓ Select Item</div> <div>+ - Change Field</div> <div>Tab Select Field</div> <div>F1 General Help</div> <div>F10 Save and Exit</div> <div>ESC Exit</div> |  |
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**LBA/ Large Mode**

Enables or disables the LBA (Logical Block Addressing)/ Large mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Options: Disabled, Auto

**DMA Mode**

Options: Auto

**S.M.A.R.T**

SMART stands for Smart Monitoring, Analysis, and Reporting Technology. It allows AMIBIOS to use the SMART protocol to report server system information over a network. Options: Auto, Disabled, Enabled

Table 42 System Information

| BIOS SETUP UTILITY                                                                                                                                                       |                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Main                                                                                                                                                                     |                                                                                                                               |
| AMIBIOS<br>Version : 1.3<br>Build Date: :12/26/08<br><br>Processor<br>Intel® Atom™ CPU N270 @ 1.60GHz<br>Speed :1600MHz<br>Count :1<br><br>System Memory<br>Size :1016MB | <> Select Screen<br>↑↓ Select Item<br>+- Change Field<br>Tab Select Field<br>F1 General Help<br>F10 Save and Exit<br>ESC Exit |
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## **Advanced Menu**

Table 43 Advanced Menu

| BIOS SETUP UTILITY                                                                                                                                                                                                                             |          |      |         |       |          |                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---------|-------|----------|-------------------------------------------------------------------------------------------------------------------------------|
| Main                                                                                                                                                                                                                                           | Advanced | Boot | Chipset | Power | Security | Exit                                                                                                                          |
| Advanced Settings<br><hr/> <b>Warning: Setting wrong values in below sections may cause system to malfunction.</b><br><br>> I/O Configuration<br>> OnBoard Peripherals Configuration<br>> Trusted Computing<br>> Hardware Health Configuration |          |      |         |       |          | <> Select Screen<br>↑↓ Select Item<br>+- Change Field<br>Tab Select Field<br>F1 General Help<br>F10 Save and Exit<br>ESC Exit |
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Press <Enter> to select a sub-menu for detailed options.

Table 44 Onboard I/O Configuration

| BIOS SETUP UTILITY                                       |              |                                                 |
|----------------------------------------------------------|--------------|-------------------------------------------------|
| Advanced                                                 |              |                                                 |
| Onboard I/O Configuration                                |              | Allow BIOS to Select Serial Port1 Base Address. |
| <b>COM1 Address</b>                                      | <b>[3F8]</b> |                                                 |
| COM1 IRQ                                                 | [4]          |                                                 |
| COM1 Function Type                                       | [RS232]      |                                                 |
| COM2 Address                                             | [2F8]        |                                                 |
| COM2 IRQ                                                 | [4]          |                                                 |
| COM3 Address                                             | [3E8]        |                                                 |
| COM3 IRQ                                                 | [10]         |                                                 |
| COM3 Mode                                                | [Normal]     |                                                 |
| COM4 Address                                             | [2E8]        |                                                 |
| COM4 IRQ                                                 | [11]         |                                                 |
| COM4 Mode                                                | [Normal]     |                                                 |
| Parallel Port Address                                    | [378]        |                                                 |
| Parallel Port Mode                                       | [Normal]     |                                                 |
| Parallel Port IRQ                                        | [IRQ7]       |                                                 |
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**COM1 Address**

Options: Disabled, 3F8, 3E8, 2E8

**COM1 IRQ**

Options: 3, 4, 10, 11

**COM1 Function Type**

Options: RS232, RS422, RS485

**COM2 Address**

Options: Disabled, 2F8, 3E8, 2E8

**COM2 IRQ**

Options: 3, 4, 10, 11

**COM3 Address**

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

**COM3 IRQ**

Options: 3, 4, 10, 11

**COM3 Mode**

Options: Normal, IrDA, ASK IR, Smart Card Reader

**COM4 Address**

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

**COM4 IRQ**

Options: 3, 4, 10, 11

**COM4 Mode**

Options: Normal, IrDA, ASK IR, Smart Card Reader

**Parallel Port Address**

Options: 378, 278, 3BC

**Parallel Port Mode**

Options: Normal, EPP, ECP, EPP+ECP

### Parallel Port IRQ

Options: IRQ5, IRQ7

Table 45 OnBoard Peripherals Configuration Settings

| BIOS SETUP UTILITY                                       |            |                                                                                                                               |
|----------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------|
| Advanced                                                 |            |                                                                                                                               |
| OnBoard Peripherals Configuration Settings               |            | Options                                                                                                                       |
| <b>USB Controller</b>                                    | [Enable]   | Disabled<br>Enabled                                                                                                           |
| USB Device Legacy Support                                | [Enable]   |                                                                                                                               |
| Audio Controller                                         | [Enable]   |                                                                                                                               |
| Onboard LAN Controller                                   | [Enable]   |                                                                                                                               |
| Onboard LAN OPTROM                                       | [Disabled] |                                                                                                                               |
|                                                          |            | <> Select Screen<br>↑↓ Select Item<br>+- Change Field<br>Tab Select Field<br>F1 General Help<br>F10 Save and Exit<br>ESC Exit |
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### USB Controller

Options: Enabled, Disabled

### USB Device Legacy Support

Options: Enabled, Disabled, Auto

### Audio Controller

Options: Enabled, Disabled

### Onboard LAN Controller

Options: Enabled, Disabled

### Onboard LAN OPTROM

Options: Enabled, Disabled

Table 46 Trusted Computing

| BIOS SETUP UTILITY                                                      |  |                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advanced                                                                |  |                                                                                                                                                                                                                            |
| <div>Trusted Computing</div> <div>TCG/TPM SUPPORT</div> <div>[NO]</div> |  | <div>Enable/ Disable TPM<br/>TCG (TPM 1.1/1.2) supp<br/>in BIOS</div> <div>&lt;&gt; Select Screen<br/>↑↓ Select Item<br/>+- Change Field<br/>Tab Select Field<br/>F1 General Help<br/>F10 Save and Exit<br/>ESC Exit</div> |
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**TCG/TPM SUPPORT**

Options: No, Yes

Table 47 Hardware Health Configuration

| BIOS SETUP UTILITY                                       |              |                                                                                                                                                                                                 |
|----------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advanced                                                 |              |                                                                                                                                                                                                 |
| Hardware Health Configuration                            |              | <div>&lt;&gt; Select Screen</div> <div>↑↓ Select Item</div> <div>+ - Change Field</div> <div>Tab Select Field</div> <div>F1 General Help</div> <div>F10 Save and Exit</div> <div>ESC Exit</div> |
| CPU Warning Temperature                                  | [Disabled]   |                                                                                                                                                                                                 |
| CPU Shutdown Temperature                                 | [Disabled]   |                                                                                                                                                                                                 |
|                                                          |              |                                                                                                                                                                                                 |
| Temperature Sensor #1                                    | :57°C/ 134°F |                                                                                                                                                                                                 |
| Temperature Sensor #1                                    | :43°C/ 109°F |                                                                                                                                                                                                 |
|                                                          |              |                                                                                                                                                                                                 |
| +VCORE                                                   | :1.136 V     |                                                                                                                                                                                                 |
| +1.05V                                                   | :1.040 V     |                                                                                                                                                                                                 |
| +3.3V                                                    | :3.166 V     |                                                                                                                                                                                                 |
| +5V                                                      | :4.958 V     |                                                                                                                                                                                                 |
| +12V                                                     | :11.182 V    |                                                                                                                                                                                                 |
| +1.8v                                                    | :1.758 V     |                                                                                                                                                                                                 |
| +VCC RTC                                                 | :3.365 V     |                                                                                                                                                                                                 |
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**CPU Warning Temperature**

Options: Disabled, 80°C/176°F, 85°C/185°F, 90°C/194°F, 95°C/203°F

**CPU Shutdown Temperature**

Options: Disabled, 80°C/176°F, 85°C/185°F, 90°C/194°F, 95°C/203°F

## ■ Boot Menu

Table 48 Boot Menu

| BIOS SETUP UTILITY                                       |          |                  |         |       |                                                                                                                                                                                                                                             |      |
|----------------------------------------------------------|----------|------------------|---------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Main                                                     | Advanced | Boot             | Chipset | Power | Security                                                                                                                                                                                                                                    | Exit |
| Boot Settings                                            |          |                  |         |       | Allow BIOS to Skip certain tests while booting. This will decrease the time needed to boot the system.<br><br><> Select Screen<br>↑↓ Select Item<br>+- Change Field<br>Tab Select Field<br>F1 General Help<br>F10 Save and Exit<br>ESC Exit |      |
| <b>Quick Boot</b>                                        |          | <b>[Enabled]</b> |         |       |                                                                                                                                                                                                                                             |      |
| Bootup Num-Lock                                          |          | [ON]             |         |       |                                                                                                                                                                                                                                             |      |
| Wait For 'F1' If Error                                   |          | [Enabled]        |         |       |                                                                                                                                                                                                                                             |      |
| Hit 'DEL' Message Display                                |          | [Enabled]        |         |       |                                                                                                                                                                                                                                             |      |
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### Quick Boot

Enabling this item allows BIOS to skip some Power On Self Tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Options: Disabled, Enabled

### Bootup Num-Lock [On]

Allow you to select the power-on state for the NumLock.

Options: Off, On

### Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed when error occurs.

Options: Disabled, Enabled

### Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message 'Press DEL to run Setup' during POST.

Options: Disabled, Enabled

## ■ Chipset Menu

Table 49 Chipset Menu

| BIOS SETUP UTILITY                                       |          |                |         |                   |          |      |
|----------------------------------------------------------|----------|----------------|---------|-------------------|----------|------|
| Main                                                     | Advanced | Boot           | Chipset | Power             | Security | Exit |
| Chipset Settings                                         |          |                |         | Options           |          |      |
| DRAM Frequency                                           |          | [Auto]         |         | Auto              |          |      |
|                                                          |          |                |         | 400 MHz           |          |      |
|                                                          |          |                |         | 533 MHz           |          |      |
| Boots Graphic Adapter Priority                           |          | [PEG/PCI]      |         | <> Select Screen  |          |      |
| Internal Graphics Mode Select                            |          | [Enabled, 8MB] |         | ↑↓ Select Item    |          |      |
| Hyper Threading Technology                               |          | [Enabled]      |         | +- Change Field   |          |      |
| > Video Function Configuration                           |          |                |         | Tab Select Field  |          |      |
|                                                          |          |                |         | F1 General Help   |          |      |
|                                                          |          |                |         | F10 Save and Exit |          |      |
|                                                          |          |                |         | ESC Exit          |          |      |
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### DRAM Frequency

Options: Auto, 400 MHz, 533MHz

### Boots Graphic Adapter Priority

Select which graphics controller to use as the primary boot device.

Options: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI

### Internal Graphics Mode Select

Select the amount of system memory used by the Internal graphics device.

Options: Disabled, Enabled 1MB, Enabled 8M

### Hyper Threading Technology

Options: Disabled, Enabled

## ■ Video Function Configuration

Table 50 Video Function Configuration

| BIOS SETUP UTILITY                                       |                     |                                                                                                                                                                            |
|----------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chipset                                                  |                     |                                                                                                                                                                            |
| Video Function Configuration                             |                     | Options                                                                                                                                                                    |
| DVMT Mode Select                                         | [DVMT Mode]         | Fixed Mode<br>DVMT Mode<br>Combo Mode<br><br><> Select Screen<br>↑↓ Select Item<br>+- Change Field<br>Tab Select Field<br>F1 General Help<br>F10 Save and Exit<br>ESC Exit |
| DVMT/FIXED Memory                                        | [128M]              |                                                                                                                                                                            |
| Boot Display Device                                      | [VGA]               |                                                                                                                                                                            |
| Flat Panel Type                                          | [1024X768 24Bit 1C] |                                                                                                                                                                            |
| Local Flat Panel Scaling                                 | [Auto]              |                                                                                                                                                                            |
| Panel BackLight Voltage                                  | [2.5]               |                                                                                                                                                                            |
| V02.61 (C)Copyright 1985-2006, American Megatrends, Inc. |                     |                                                                                                                                                                            |

### DVMT Mode Select

Options: Fixed Mode, DVMT Mode, Combo Mode

### DVMT/FIXED Memory

Options: 64MB, 128MB, Maximum DVMT

### Boot Display Device

Options: VGA, LVDS, VGA+LVDS

### Flat Panel Type

Options:

|           |           |
|-----------|-----------|
| 640x480   | 24Bit 1CH |
| 1024x768  | 24Bit 1CH |
| 1280x1024 | 24Bit 2CH |
| 1600x1200 | 24Bit 2CH |

### Local Flat Panel Scaling

Options: Auto, Forced Scaling, Disabled

### Panel BackLight Voltage

Options: Min 0.0V, Max: 5.0V

## ■ Power Menu

Table 51 Power Menu

| BIOS SETUP UTILITY                                                                                                                                                                                                                                                                                                                                                                                               |          |      |         |       |                                                                                                                                                                                                                                                          |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Main                                                                                                                                                                                                                                                                                                                                                                                                             | Advanced | Boot | Chipset | Power | Security                                                                                                                                                                                                                                                 | Exit |
| <div>Power Management Setting</div> <div>ACPI Function [Enabled]</div> <div>Suspend mode [S3 (STR)]</div> <div>Repost Video on S3 Resume [No]</div> <div>Suspend Time Out [Disabled]</div> <div>Restore on AC Power Loss Power Off]</div> <div>Resume By USB Device [Disabled]</div> <div>Resume On PME# [Disabled]</div> <div>Resume By PCI-E Device [Disabled]</div> <div>Resume On RTC Alarm [Disabled]</div> |          |      |         |       | <div>Select the ACPI state used for System Suspend</div> <div>&lt;&gt; Select Screen</div> <div>↑↓ Select Item</div> <div>+ - Change Field</div> <div>Tab Select Field</div> <div>F1 General Help</div> <div>F10 Save and Exit</div> <div>ESC Exit</div> |      |
| V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.                                                                                                                                                                                                                                                                                                                                                         |          |      |         |       |                                                                                                                                                                                                                                                          |      |

### ACPI Function

Enable/ Disable ACPI support for Operating System.

ENABLE: If OS supports ACPI, DISABLE: IF OS Does not support ACPI.

### Suspend mode

Options: S1 (POS), S3 (STR)

### Repost Video on S3 Resume

Options: No, Yes

### Suspend Time Out

Options: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, 60 Min

### Restore on AC Power Loss

Options: Power OFF, Power ON, Last State

### Resume By USB Device

Enable/ Disable USB Device Wakeup From S3/S4

Options: Disabled, Enabled

### Resume On PME#

Options: Disabled, Enabled

### Resume By PCI-E Device

Options: Disabled, Enabled

### Resume On RTC Alarm

Options: Disabled, Enabled,

If the value is Enabled.

|                                   |                                                                                                |
|-----------------------------------|------------------------------------------------------------------------------------------------|
| RTC Alarm Date (Days) [Every Day] | KeyIn "+" "-" to select                                                                        |
| RTC Alarm Time [00:00:00]         | Use [ENTER], [TAB] or [SHIFT+TAB] to select a field<br>Use [+] or [-] to configure system time |

## Security Menu

Table 52 Security Menu

| BIOS SETUP UTILITY                                                                                                                                                                      |          |      |         |       |                                                                                                                                                                                                                                           |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Main                                                                                                                                                                                    | Advanced | Boot | Chipset | Power | Security                                                                                                                                                                                                                                  | Exit |
| <div>Security Setting</div> <div>Supervisor Password :Not Installed</div> <div>User Password :Not Installed</div> <div>Change Supervisor Password</div> <div>Change User Password</div> |          |      |         |       | <div>Install or Change the password</div> <div>&lt;&gt; Select Screen</div> <div>↑↓ Select Item</div> <div>+ - Change Field</div> <div>Tab Select Field</div> <div>F1 General Help</div> <div>F10 Save and Exit</div> <div>ESC Exit</div> |      |
| V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.                                                                                                                                |          |      |         |       |                                                                                                                                                                                                                                           |      |

### Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

### Change User Password

Select this item to set or change the user password. The User Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

## ■ Exit Menu

Table 53 Exit Menu

| BIOS SETUP UTILITY                                                                                                                                                                                |          |      |         |       |                                                                                                                                                                                                                                                                |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Main                                                                                                                                                                                              | Advanced | Boot | Chipset | Power | Security                                                                                                                                                                                                                                                       | Exit |
| <div>Exit Setting</div> <div><div>Save Changes and Exit</div><div>Discard Changes and Exit</div><div>Discard Changes</div><div>Load Optimal Defaults</div><div>Load Failsafe Defaults</div></div> |          |      |         |       | <div>Exit System Setup after saving the changes.</div> <div>F10 key can be used for this operation.</div> <div>&lt;&gt; Select Screen<br/>↑↓ Select Item<br/>+- Change Field<br/>Tab Select Field<br/>F1 General Help<br/>F10 Save and Exit<br/>ESC Exit</div> |      |
| V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.                                                                                                                                          |          |      |         |       |                                                                                                                                                                                                                                                                |      |

### Save Changes and Exit

Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

### Discard Changes and Exit

Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

### Discard Changes

Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

### Load Optimal Defaults

Load Optimal Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

### **Load Failsafe Defaults**

Load Optimal Default values for all the setup values. This option allows you to load failsafe default values for each of the parameters on the Setup menus, which will provide the most stable performance settings. The F8 key can be used for this operation.

## Chapter 5

# Driver Installation

If your KEMX-2030 does not come with an operating system pre-installed, you will need to install an operating system and the necessary drivers to operate it. After you have finished assembling your system and connected the appropriate power source, power it up using the power supply and install the desired operating system. You can download the drivers for the KEMX-2030 from the Quanmax website at [www.quanmax.com](http://www.quanmax.com) and install as instructed there. For other operating systems, please contact Quanmax.

---

### NOTE



When the system reboots without connecting the CRT, there might be no image on screen when you insert the CRT/VGA cable. Please pressing **<Ctrl>+<Alt>+<F1>** simultaneously to show the image on screen.

---

# Appendix A

## System Resources

### Interrupt Request (IRQ) Lines

| IRQ # | Used For                                              | Comment  |
|-------|-------------------------------------------------------|----------|
| 0     | Timer0                                                |          |
| 1     | keyboard controller                                   |          |
| 2     | Cascade                                               |          |
| 3     | COM2                                                  | Note (1) |
| 4     | COM1                                                  | Note (1) |
| 5     | Free                                                  |          |
| 6     | Floppy disk controller                                | Note (1) |
| 7     | Free                                                  |          |
| 8     | Real Time Clock                                       |          |
| 9     | ACPI-Compliant System                                 |          |
| 10    | Free                                                  |          |
| 11    | COM3&4                                                | Note (1) |
| 12    | PS/2 Mouse                                            | Note (1) |
| 13    | Floating point unit (FPU /<br>NPU / Math coprocessor) |          |
| 14    | Primary IDE channel                                   | Note (1) |
| 15    | Secondary IDE channel                                 | Note (1) |

Note: If the “Used For” device is disabled in setup, the corresponding interrupt is available for other devices.

### DMA Channels

| DMA # | Used For               | Comment                              |
|-------|------------------------|--------------------------------------|
| 0     | Memory Refresh         |                                      |
| 1     | Sound                  | Note (1)                             |
| 2     | Floppy disk controller | Note (1)                             |
| 3     | free                   | Unavailable if LPT used in ECP mode. |
| 4     | Cascade                |                                      |
| 5     | Sound                  | Note (1)                             |
| 6     | free                   |                                      |
| 7     | free                   |                                      |

Note: If the "Used For" device is disabled in setup, the corresponding interrupt is available for other devices.

### Memory Mapping

| Upper Memory                       | Used For       | Comment |
|------------------------------------|----------------|---------|
| C0000h - CBFFFh                    | VGA BIOS       | No      |
| CC000h - CFFFFh<br>CD000h - CDFFFh | LAN Option ROM | Yes     |
| E0000h - FFFFFh                    | System BIOS    | No      |

### PCI Devices

| PCI Device | PCI Interrupt | Comment |
|------------|---------------|---------|
| LAN        | INTA          | AD20    |
|            |               |         |

### PCI Express Devices

| PCIe Device    | PCIe Interrupt | Comment |
|----------------|----------------|---------|
| PCIe x1 Slot 1 | INTC           |         |
|                |                |         |

### Inter-IC Bus (I2C)

| I2C Address | Used For                       | Comment |
|-------------|--------------------------------|---------|
| A0h         | DDR2-RAM DIMM Socket 0 Address |         |

### ISA I/O Port

| I2C Address | Used For       | Comment                         |
|-------------|----------------|---------------------------------|
| 2Eh         | Super I/O      |                                 |
| 2Eh         | WatchDog Timer | Reference register in Super I/O |

### I/O Address Map

| I/O Address            | Used For            | Comment |
|------------------------|---------------------|---------|
| 00h – 0Fh<br>C0h – DFh | 8237DMA Controller  |         |
| 20h, 21h               | 8259A PIC           |         |
| 2Eh, 2Fh               | SuperIO Access Port |         |
| A0h, A1h               | 8259A PIC           |         |
| 40h – 43h (XT/AT)      | 8254PIT             |         |

|                  |                                                   |  |
|------------------|---------------------------------------------------|--|
| 44h – 47h (PS/2) |                                                   |  |
| 60h – 64h        | KeyBoard Controller                               |  |
| 90h – 96h        | PS/2 P OS                                         |  |
| F0h – FFh        | Math Co-Processor, X87 Unit                       |  |
| 170h – 177h      | Secondary IDE                                     |  |
| 1F0h – 1F7h      | Primary IDE                                       |  |
| 200h – 22Fh      | GAME I/O                                          |  |
| 220h – 22Fh      | Sound Blaster / AD Lib                            |  |
| 279h, A79h       | Plug and Play Configuration Register              |  |
| A15h, A16h       | HW Monitor Access Port                            |  |
| 2E8h – 2EFh      | COM4                                              |  |
| 2F8h – 2FFh      | COM2                                              |  |
| 378h – 37Ah      | Parallel Printer Port                             |  |
| 3B0h – 3BFh      | MDA / MGA                                         |  |
| 3C0h – 3CFh      | EGA / VGA                                         |  |
| 3D4h – 3D9h      | CGA/CRT Register, Controller and Palette Register |  |
| 3F0h – 3F7h      | Floppy Diskette                                   |  |
| 3F6h, 3F7h       | Enhanced IDE                                      |  |
| 3E8h – 3EFh      | COM3                                              |  |
| 3F8h – 3FFh      | COM1                                              |  |
| 0CF8h            | PCI Configuration Register/address                |  |
| 0CFCh            | PCI Configuration Register/data                   |  |

#### Hardware Monitor Parameters

| IT8781F Pin Name | Voltage/Temperature | Function/Comments                    |
|------------------|---------------------|--------------------------------------|
| VIN0             | +VCORE              | Processor core voltage               |
| VIN1             | +1.05V              | +/- 5%                               |
| VIN2             | +3.3V               | +/- 5%                               |
| VIN3             | +5V                 | +/- 5%                               |
| VIN4             | +12V                | +/- 5%                               |
| VIN5             | Chip core 1.5V      | +/- 5%                               |
| VIN6             | DDR 1.8V            | +/- 5%                               |
| 5VSB             | 5VSB                | +/- 5%                               |
| SYS_TEMP         | System Temperature  |                                      |
| CPU_TEMP         | CPU Temperature     |                                      |
| PRDCHOT#         |                     | CPU over temperature shutdown output |
| BEEP             |                     | Beep function for hardware monitor   |

## Appendix B

# DIO (Digital I/O) KIT User Guide

The purpose of this document is to provide detail instruction on how to install and utilized the Quanmax DIO Tool on Microsoft Windows XP.

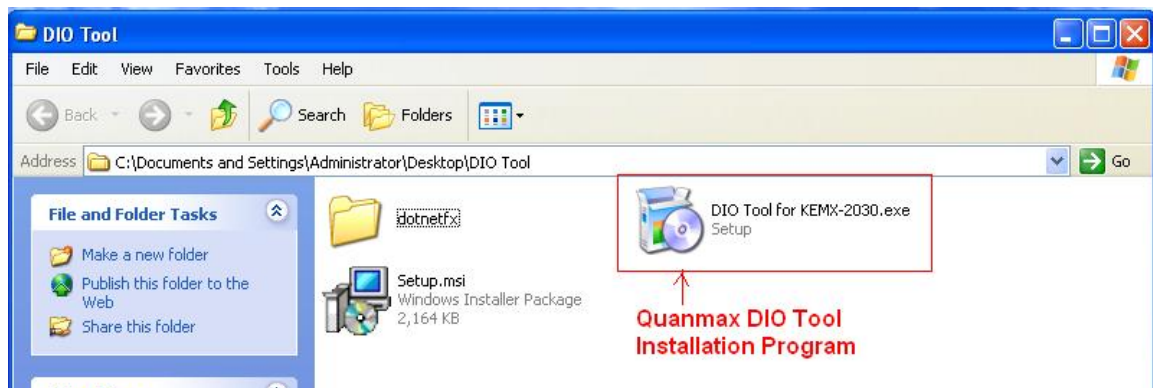


### WARNING

The program is platform specific. Therefore, do not use the DIO Tool to other platform to prevent adverse effect.

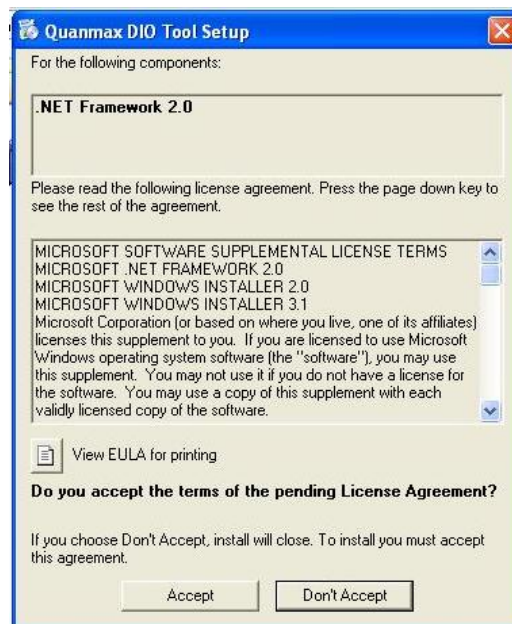
### How to install the test program:

Go in to the “DIO KITS” folder. Double Click on the DIO installation program to start the installation.

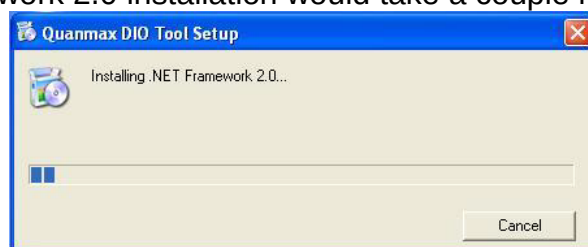


The installation program name will vary according to the platform which it applied to. For example, if the platform name is KEMX-2030, the installation program will be name as “DIO Tool for KEMX-2030.exe”.

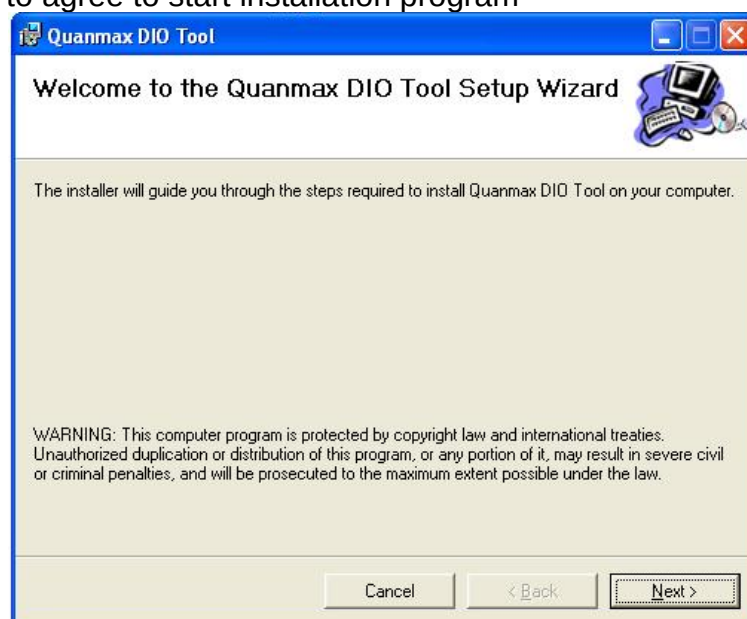
As the .NET Framework 2.0 is a prerequisite, the installation program will prompt to install .NET Framework installation first should the .NET Framework 2.0 is not installed.



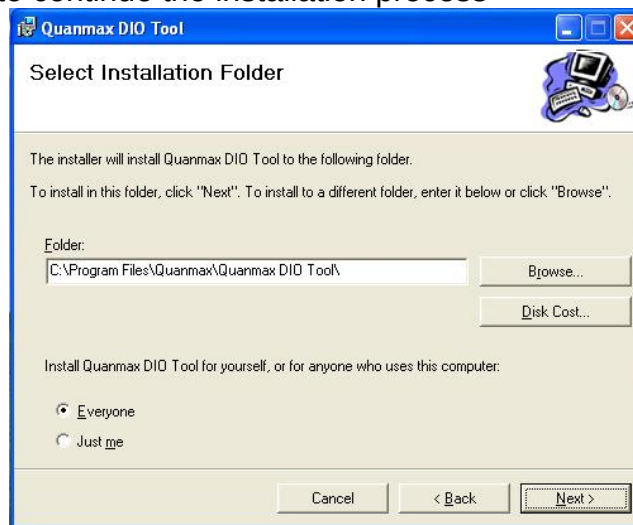
The .NET Framework 2.0 installation would take a couple minutes to finish.



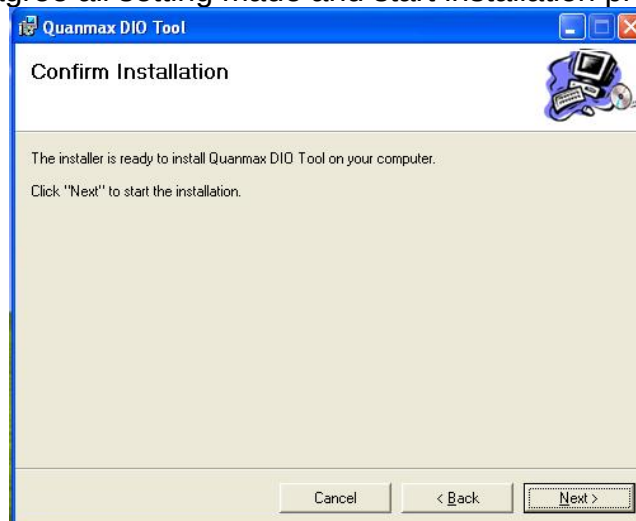
Click "Next" to agree to start installation program



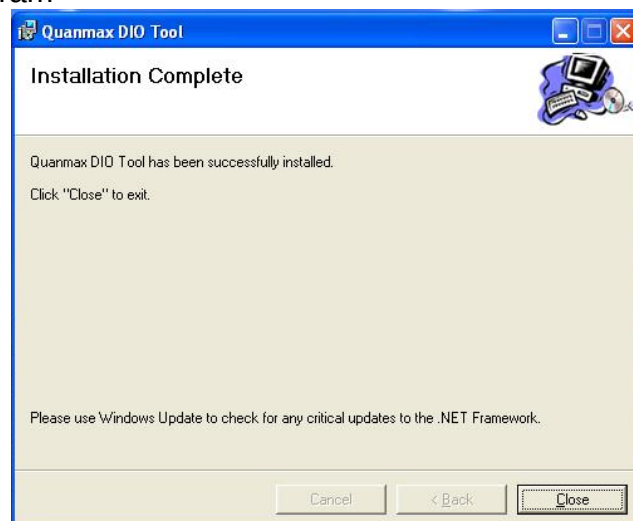
After enter the path where you wish to install the DIO Test Package, Click “Next” to agree to continue the installation process



Click “Next” to agree all setting made and start installation process



After the installation process is complete, click “Close” to close down the installation program



Installation is now complete.

### How to run the test program:

Click on "Start"->"All Programs"->"Quanmax DIO Tool"->"DIO TOOL" to start the DIO test program

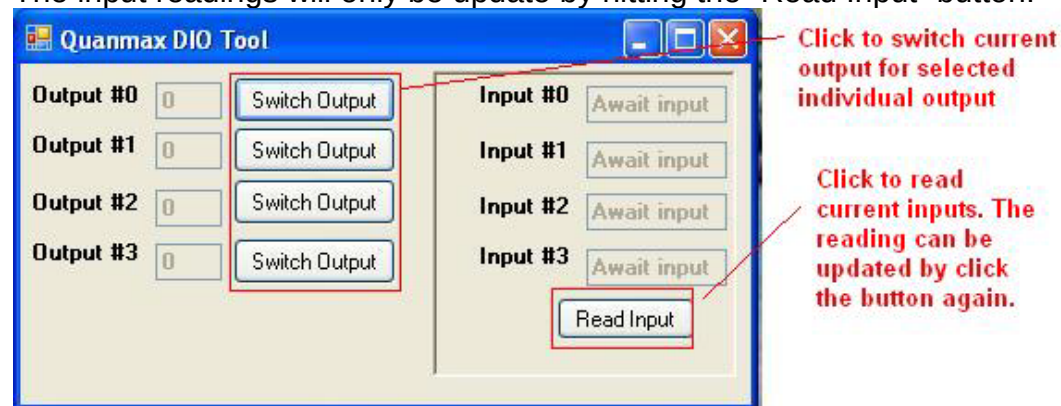


The test tool is launch.

All output will be set to low as default value when program initialized.

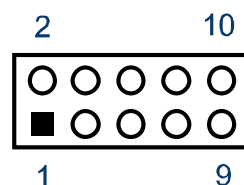
Click on "Switch Output" button can switch the corresponding output.

The input readings will only be update by hitting the "Read Input" button.



### CN3 to DIO Program look up table:

| Pin #      | 2 | 4 | 6 | 8 | 10 (GND) |
|------------|---|---|---|---|----------|
| DIO Input# | 0 | 1 | 2 | 3 | --       |

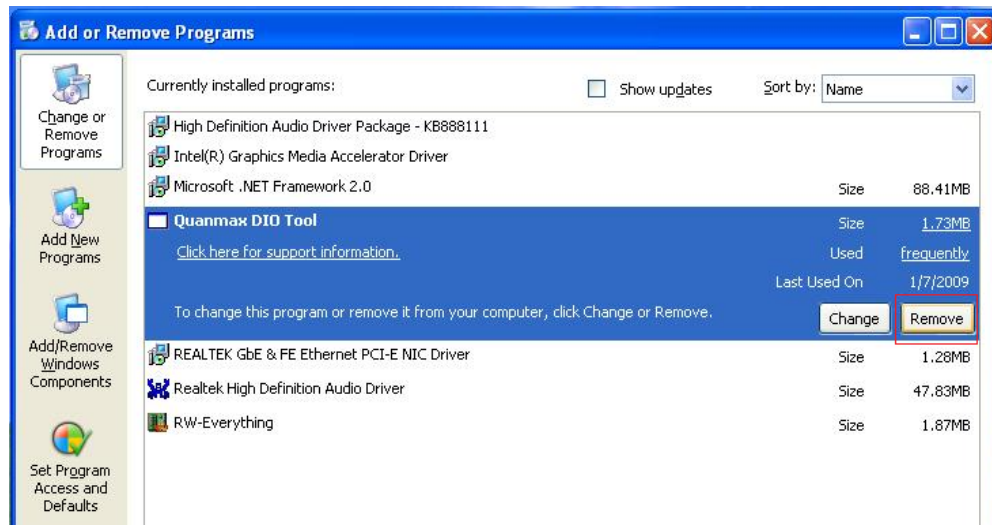


| Pin #        | 1 | 3 | 5 | 7 | 9 (+5V) |
|--------------|---|---|---|---|---------|
| DIO Output # | 0 | 1 | 2 | 3 | --      |

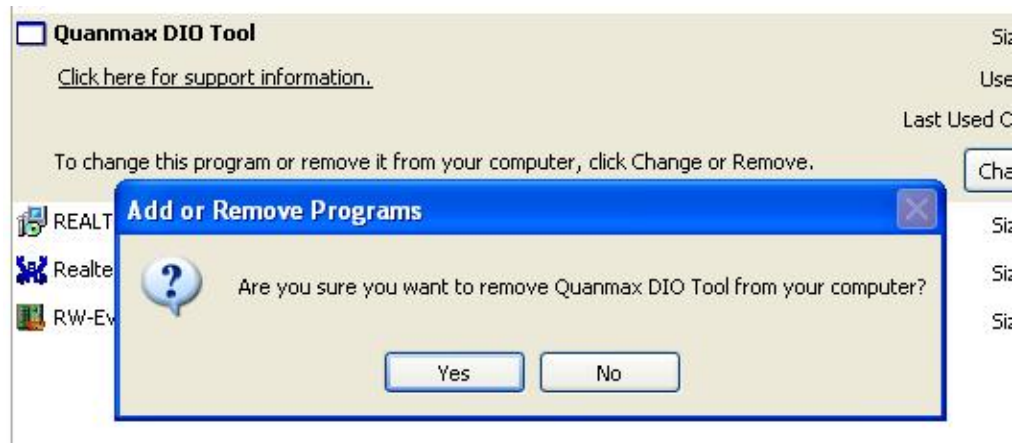
## How to uninstall the test program:

From Control Panel, select the “Add or Remove Program”.

Select the “Quanmax DIO Tool”, click on “Remove” button to start the uninstall process



Click on “Yes” button to confirm the removal of the DIO Tool Kit.



## Appendix C

# DIO (Digital I/O) Sample Code

```
//=====
//KEMX-2030 DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//=====
int main(){

//Reset Output Pins to all zero
outp(0x048d,0x1b);
system("pause");
//Turn on the output #1
//Bit 2 is output 1
outp(0x048d,0x1f);
system("pause");
//Turn off the output #1
outp(0x048d,0x1b);
system("pause");
//Turn on the output #2
//Bit 5 is output 2
outp(0x048d,0x3b);
system("pause");
//Turn off the output #2
outp(0x048d,0x1b);
system("pause");
//Turn on the output #3
//Bit 6 is output 3
outp(0x048d,0x5b);
system("pause");
//Turn off the output #3
outp(0x048d,0x1b);
system("pause");
//Turn on the output #4
//Bit 7 is output 4
outp(0x048d,0x9b);
system("pause");
//Turn off the output #4
outp(0x048d,0x1b);
system("pause");
```

```
//Read Input pins
inp(0x48c); //bit 1 is input #1
           //bit 2 is input #2
system("pause");
inp(0x48d); //bit 1 is input #3
           //bit 2 is input #4
system("pause");
return 0;
}
```

## Appendix D

# WatchDog Timer Sample Code

```
//=====
//KEMX-2030 DOS Watchdog sample program
//Please compile with Turbo C 3.0 to utilized the program
//=====
int main()
{
//Initialized the WDT program
  outp(0x2e,0x87);
  outp(0x2e,0x01);
  outp(0x2e,0x55);
  outp(0x2e,0x55);

//Setting Logical Device Number to 0x07
  outp(0x2e,0x07);
  outp(0x2f,0x07);

//Set Timer Value(0x73 is LSB while 0x74 is MSB)
  outp(0x2e,0x73);
  outp(0x2f,0x14);//set to 20 sec (0x14)

//Set Timer Unit to Second/Minute(Bit 7 equal to 1 is second/0 is minute)
//Enable WDT (Bit 4 equal to 1 is enable/0 is disable)
  outp(0x2e,0x72);
  outp(0x2f,0x90);//The unit is set as second
  return 0;
}
```